Amendments to the Drawings

The attached drawing sheets include changes to Fig. 2 and Fig. 4. These sheets, which include Fig. 2 and Fig. 4, replace the original sheets including Fig. 2 and Fig. 4. In Fig. 2, block 230 has been updated to correct a typographical error. In Fig. 4, block 420 has been updated to correct a typographical error.

Attachment: Replacement Sheets (2)

REMARKS

Applicants respectfully traverse and request reconsideration.

Amendments

Various amendments have been made to both the figures and the Written Description. The aforementioned amendments correct typographical errors and are therefore believed not to add new matter.

Claims 35-36 have been canceled without prejudice. New claims 37-47 have been added. Claims 12-13, 15-19 and 34 have been amended. Applicants respectfully submit that the aforementioned amendments do not add new matter.

Claims Rejections

Claims 12, 13, 15 and 16

Claims 12, 13, 15 and 16 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Publication No. 2003/0229816 A1 to Meynard ("Meynard") in view of U.S. Patent No. 5,490,059 to Mahalingaiah et al. ("Mahalingaiah"). Meynard is directed to a clock control arrangement for a computing system. (Title). The system generally includes a control unit that receives two inputs representing an activity of a processor and a temperature of the chip and further generates a control signal. (*See* generally, FIG. 1, ¶¶ 53-54). A controllable clock circuit receives the control signal and appears to use it to generate at least two different clock signals without using temperature date. (*Id.*). A processor is then driven using one of the at least two different clock signals. (*Id.*).

With respect to claim 12, Applicants claim a clock control system for generating a clock signal comprising, among other things: (1) "a thermal sensor control circuit … operative to

produce temperature data in response to the temperature signal and to provide an interrupt control signal in response to the temperature data"; and (2) "a dynamic overclock frequency control data generator … operative to provide dynamic overclock frequency control data to the clock generator circuit in response to the interrupt control signal and the received temperature data." (Emphasis added). The provided dynamic overclock frequency control data causes "the clock generator circuit to increase the operating frequency of the clock signal above the nominal operating frequency, when the detected junction temperature is less than the maximum rated junction temperature."

The office action states that Meynard teaches all of the elements of claim 12 but for the claimed thermal sensor control circuit and the claimed maximum rated junction temperature. According to the office action, Mahalingaiah teaches these elements. While Applicants agree that Meynard fails to teach or suggest Applicants' claimed thermal sensor control circuit, Applicants disagree that Meynard teaches or suggests Applicants' claimed dynamic overclock frequency control data generator that is "operative to provide dynamic overclock frequency control data to the clock generator circuit in response to the interrupt control signal and the received temperature data …". (Emphasis added). Applicants further disagree that Mahalingaiah teaches or suggests Applicants' claimed thermal sensor control circuit that is "operative to produce temperature data in response to the temperature signal and to provide an interrupt control signal in response to the temperature data." (Emphasis added).

Turning to Meynard, the office action appears to state that the claimed dynamic overclock frequency control data generator is analogous to the control unit of Meynard as illustrated in FIG. 1 as block 230 or in FIG. 5 as block 530. In order to teach or suggest Applicants' claimed dynamic overclock frequency control data generator, Applicants

respectfully submit that the prior art component must be capable of, among other things, receiving received temperature data and an interrupt control signal that is provided in response to the temperature data, and must use each to cause the clock generator circuit to increase the operating frequency of the clock signal above the nominal operating frequency. At best, Meynard's control unit (element 230 or 530) is capable of receiving temperature data and information regarding activity of a processor. Meynard does not appear to teach or suggest the receipt of an interrupt control signal by a dynamic overclock frequency data generator.

Applicants respectfully direct the Examiner's attention to FIG. 2 and FIG. 5, where the control unit 230 and 530, allegedly equivalent to Applicants' claimed dynamic overclock frequency control data generator, receives temperature information from a temperature sensing device 280 or 520. The control unit 230 and 530 also receives information from a block next request control lead 240 or a saturation detection unit 510. In the former, the control unit 230 receives information from a BNR control lead 240 that provides a close monitoring of the saturation of the processor (i.e., monitoring of the activity of the processor). (¶ 52). In the latter, the saturation detection unit 510 detects a saturation condition within said processor (e.g., a type of activity level) and monitors the transactions on the bus 540 by the information carried on a lead 541. (¶ 73). Because detected activity levels of a processor appears to be unrelated to an interrupt control signal provided in response to the temperature data, Applicants respectfully submit that Meynard fails to teach or suggest Applicants' claimed dynamic overclock frequency control data generator.

Because Meynard does not teach or suggest Applicants' claim language as alleged by the office action, no combination of the cited prior art is capable of rendering obvious Applicant's

claimed dynamic overclock frequency control data generator and the receipt of an interrupt control signal. For at least this reason, claim 12 appears to be in proper condition for allowance.

Turning to Mahalingaiah, the office action cites Mahalingaiah as teaching a thermal sensor control circuit that is operative to produce temperature data in response to the temperature signal and to provide an interrupt control signal in response to the temperature data. The office action specifically cites the control unit 134 as allegedly equivalent to the claimed thermal sensor control circuit and further cites the control unit's output, command signal 122, as allegedly equivalent to Applicants' claimed produced temperature data. (Office Action, p. 3, l. 22 – p. 4, l. 3). Applicants respectfully submit that this citation to Mahalingaiah is improper because it: (1) improperly characterizes the nature of the information represented by command signal 122; and (2) ignores claim language directed to the provision of an interrupt control signal that is provided by the thermal sensor control circuit in response to the temperature data.

Applicants respectfully draw the Examiner's attention to column 3, lines 40-65 where Mahalingaiah teaches that "microprocessor 102 includes a temperature sensor 130 situated on a semiconductor die of which microprocessor 102 is physically fabricated. During operation, temperature sensor 130 provides an output signal at line 132 which is received by a control unit 134. … Control unit 134 generates the two-bit control signal Command [1:0] depending upon the output signal from temperature sensor 130. … [T]he Command [1:0] signal may cause the frequency synthesizer 110 to either increase the frequency of the CPU clock signal, to decrease the frequency of the CPU clock signal, or to hold the frequency of the CPU clock signal." In other words, the output of the control unit 134 does not appear to be temperature data as suggested by the office action, but rather control data that causes the frequency synthesizer 110

to either increase, decrease or hold the frequency of the CPU clock signal. For this reason alone, Applicants respectfully submit that the rejection is improper and the claim is properly allowable.

For argument's sake, even if Mahalingaiah did teach or suggest that the control unit 134 was capable of producing temperature data, nothing in the office action or in the cited portions of Mahalingaiah or other cited prior art references appears to teach or suggest the provision of an interrupt control signal in response to the temperature data in addition to the production of temperature data as claimed by Applicants. More specifically, nothing in the office action or the cited prior art appears to teach or suggest Applicants' claimed thermal sensor control circuit that is operative to produce temperature data in response to the temperature signal and to provide an interrupt control signal in response to the temperature data. Thus, this reason alone supports the allowance of Applicants' claim 12.

Claims 13 and 15-16 contain addition novel, non-obvious and patentable subject matter. The claims further depend from allowable claim 12 and are believed to be allowable for at least this reason and for those reasons articulated above.

Claims 17-19

Claims 17-19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,397,343 to Williams et al. ("Williams") in view of Mahalingaiah. As to claim 17, the office action states that Williams discloses all of the elements of the claimed method but "does not explicitly disclose a thermal sensor control circuit, operatively coupled to the thermal sensor, and operative to produce temperature data in response to the temperature signal and to provide a control signal in response to the temperature data; or, that the temperature threshold is the maximum rated junction temperature." Applicants respectfully agree with this characterization of Williams. The office action, however, cites Mahalingaiah as teaching these

limitations. Applicants respectfully reassert the relevant remarks made above with respect to claim 12; namely, that Mahalingaiah appears to teach a control unit that is only capable of generating a command signal based on temperature data from a temperature sensor. Mahalingaiah does not appear to teach or describe a control unit or thermal sensor control circuit that provides an interrupt control signal and temperature data in response to the temperature signal. For at least this reason, claim 17 appears to be in proper condition for allowance.

Claims 18 and 19 add additional novel and non-obvious, patentable subject matter. The aforementioned claims further depend upon allowable claim 17 and are therefore believed to be in proper condition for allowance for at least the same reasons as articulated above with respect to claim 17.

Claims 34-36

Claims 34-36 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Meynard in view of Mahalingaiah and in further view of U.S. Patent No. 6,889,332 to Helms et al. ("Helms"). As to claim 34, Applicants respectfully reassert the relevant remarks made above with respect to Meynard and Mahalingaiah. For this reason alone, Applicants respectfully submit that the claim is properly allowable over the cited prior art. Claims 35 and 36 add additional novel and non-obvious, patentable subject matter. The aforementioned claims further depend upon allowable claim 34 and are therefore believed to be in proper condition for allowance for at least the same reasons as articulated above with respect to claim 34.

New Claims 37-47

Claim 37 is dependent upon claim 16 and further adds additional novel and non-obvious, patentable subject matter. Because claim 16 depends on allowable base claim 12, claim 37 is

believed to be allowable over the cited prior art for at least the same reasons as articulated above with respect to claim 16.

Claims 38-44 add additional novel and non-obvious, patentable subject matter. The aforementioned claims further depend upon allowable claim 34 and are therefore believed to be in proper condition for allowance for at least the same reasons as articulated above with respect to claim 34.

New claim 45 incorporates similar limitations as claims 12 and 34 and further includes "memory comprising data representing junction temperatures over a temperature operating range with corresponding clock signal frequencies, wherein the data representing junction temperatures over a temperature operating range with corresponding clock signal frequencies account for a predetermined physical installation of the circuit on the die." Accordingly, Applicants reassert the relevant remarks made above. Because Applicants are unable to find any teachings or suggestions in the cited prior art that anticipates or otherwise renders obvious the features of claim 45 including but not limited to memory comprising data representing junction temperatures over a temperature operating range with corresponding clock signal frequencies that account for a predetermined physical installation of the circuit on the die, claim 45 appears to be in proper condition for allowance.

Claims 46-47 add additional novel and non-obvious, patentable subject matter. The aforementioned claims further depend upon allowable claim 45 and are therefore believed to be in proper condition for allowance for at least the same reasons as articulated above with respect to claim 45.

Accordingly, Applicants respectfully submit that the claims are in condition for allowance and that a timely Notice of Allowance be issued in this case. The Examiner is invited

to contact the below-listed attorney if the Examiner believes that a telephone conference will advance the prosecution of this application.

Respectfully submitted,

Date: 04/20/07

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